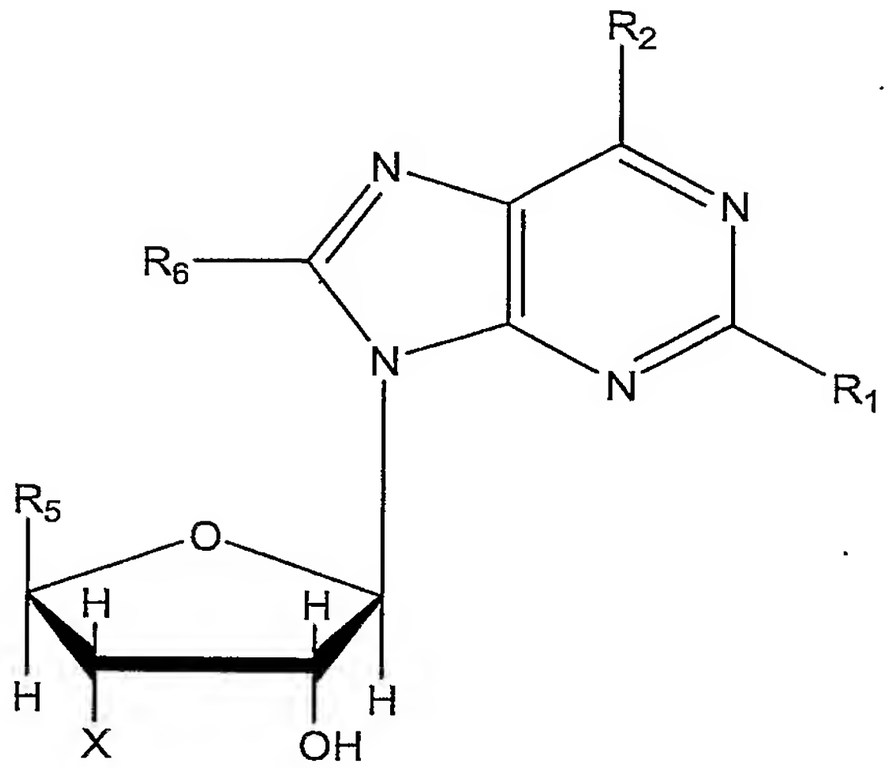
Claims

1. A compound of the following general formula, or a pharmaceutically acceptable salt thereof, for use as a medicament:



wherein:

(I) when X = OH, $R_2 = NH_2$, $R_5 = CH_2OH$, R_6 = H, R_1 is C_5-C_6 alkoxy, OCH_2Cyclopropyl, OCH_2Cyclopentyl, O-(2,2,3,3-tetrafluoro-cycloButyl), phenoxy, substituted phenoxy, OCH_2CH_2OH, or OCH_2CHF_2, (5-indanyl)oxy, C_1, C_2, C_5, or C_6 alkylamino, (R) or (S)-sec-Butylamino, C_5 or C_6 cycloalkylamino, exo-norbornane amino, (N-methyl, N-isoamylamino), phenylamino, phenylamino with either methoxy or fluoro substituents, a C_2 sulfone group, a C_7 alkyl group, a cyano group, a $CONH_2$ group, or 3,5-dimethylphenyl; or

when X = H, $R_2 = NH_2$, $R_5 = CH_2OH$, R_6 = H, R_1 is *n*-hexyloxy; or

(II) when X = OH, R_1 = H, $R_5 = CH_2OH$, R_6 = H, R_2 is NMe_2, N-(2-isopentenyl), piperazinyl, (N-Me, N-benzyl), (N-Me, N-CH_2Ph(3-Br)), (N-Me, N-CH_2Ph(3-CF_3)), or (N-Me, N-(2-methoxyethyl)), or OCH_2Cyclopentyl; or

(III) when X = OH, $R_5 = CONHR_3$, R_6 = H:

R_1 is H, R_3 is an isopropyl group, and R_2 is either NH_2 or a methylamino group (NHMe) or an isoamyl group ($CH_2CH_2CHMe_2$); or

R_1 is H, R_3 is H, and R_2 is NH_2; or

R_1 is OMe, R_3 is Ph, and R_2 is NH_2; or

R_1 is $NHCH_2CH_2CH_2CH_2CH_2Me$, R_3 is $CH_2CH_2CH_2Me$, and R_2 is NH_2; or

(IV) when X = OH, R_1 = H, R_2 = NH_2, R_5 = CH_2NHCOR_4, R_6 = H, R_4 is *n*-propyl or $NHCH_2CH_3$; or

(V) when X = OH, R_5 = CH_2OH, R_6 = H:

R_1 is NHCyclohexyl when R_2 is NMe_2; or

R_1 is OMe when R_2 is NHBenzyl; or

(VI) when X = OH, R_2 = NH_2, R_5 = CH_2OH, R_6 = Me, R1 is NHCyclohexyl, NHCyclopentyl, or NH-n-Hexyl.

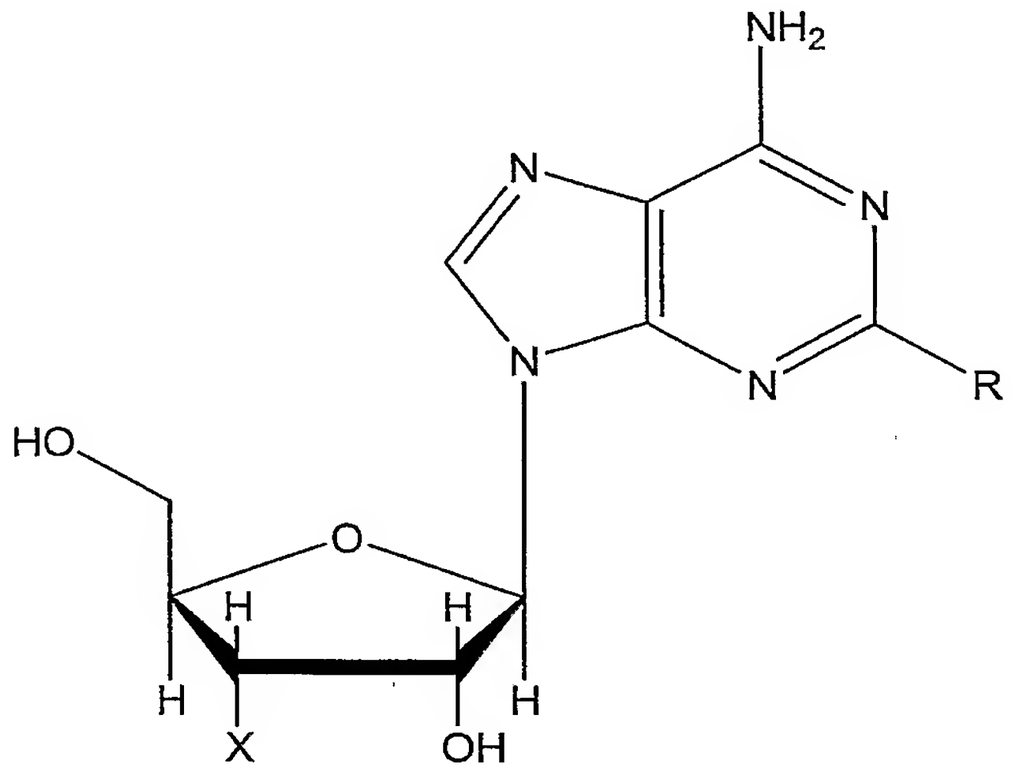
2. A compound according to formula (I) of claim 1, or a pharmaceutically acceptable salt thereof, for use as a medicament, wherein when X is OH, R_2 is NH_2, R_5 is CH_2OH, and R_6 is H, R_1 is phenoxy substituted with 4-nitrile, 4-methyl, 3-phenyl, 3-bromo, 3-isopropyl, 2-methyl, 2,4-difluoro, 2,5-difluoro, 3,4-difluoro, 2,3,5-trifluoro, or (3-methyl,4-fluoro).

3. A compound according to claim 1 or 2, with a structure as defined in any of Examples 1-6, or a pharmaceutically acceptable salt thereof, for use as a medicament.

4. A compound according to claim 3, with a structure corresponding to any of compound numbers 2, 3, 7-19, 22-25, 28, 31-33, or 35-60 as defined in Examples 1-6, or a pharmaceutically acceptable salt thereof, for use as a medicament.

5. A compound according to claim 3, with a structure corresponding to any of compound numbers 2, 3, 7-18, 22-25, 31-33, 35, 37, 40, 44, 45, 47, 48, or 51-60 as defined in Examples 1-6, or a pharmaceutically acceptable salt thereof, for use as a medicament.

6. Use of a compound as defined in any preceding claim, or a pharmaceutically acceptable salt of a compound of formula (VII), in the manufacture of a medicament for the prevention, treatment, or amelioration of a pathological condition that can be improved or prevented by agonism of adenosine A2A receptors:



(VII)

wherein: R is C_{1-4} alkoxy, and X is H or OH.

7. Use of a compound of formula (VII) as defined in claim 6, in the manufacture of a medicament for the prevention, treatment, or amelioration of a pathological condition that can be improved or prevented by agonism of adenosine A2A receptors, excluding pain, cancer, inflammation, auto-immune disease, ischemia-reperfusion injury, epilepsy, sepsis, septic shock, neurodegeneration (including Alzheimer's Disease), muscle fatigue and muscle cramp.

8. Use of a compound as defined in any of claims 1 to 5, or a pharmaceutically acceptable salt of a compound of formula (VII) as defined in claim 6, in the manufacture of a medicament for the prevention, treatment, or amelioration of pain.

9. Use according to claim 8, wherein the pain is hyperalgesia.

10. Use according to claim 9, wherein the hyperalgesia is neuropathic pain.

11. Use according to any of claims 8 to 10 for the prevention, treatment, or amelioration of: pain associated with cancer, pancreatic pain, pelvic/perineal pain, pain associated with HIV infection, chronic neuropathic pain, lower back pain, failed back surgery pain, back pain, post-operative pain, post physical trauma pain, cardiac pain, chest pain, pelvic pain/PID, joint pain, neck pain, bowel pain, phantom limb pain, obstetric pain, acute herpes zoster pain, acute pancreatitis breakthrough pain, or for the prevention, treatment, or amelioration of neuropathic or other pain caused by, or associated with diabetic neuropathy, polyneuropathy, fibromyalgia, myofascial pain syndrome, osteoarthritis, post herpetic neuralgia, rheumatoid arthritis, sciatica/lumbar radiculopathy, spinal stenosis, temporo-mandibular joint disorder, trigeminal neuralgia, renal colic, dysmenorhoea/endometriosis.

12. Use according to claim 9, wherein the hyperalgesia is inflammatory pain.

13. Use according to any of claims 8, 9, or 12 wherein the pain is caused by or associated with an inflammatory or immune disease, or as a result of combined inflammatory, autoimmune and neuropathic tissue damage.

14. Use according to any of claims 8, 9, 12, or 13 for the prevention, treatment, or amelioration of bowel pain, pain associated with cancer, back pain, post-operative pain, or for the prevention, treatment, or amelioration of inflammatory or other pain caused by, or associated with rheumatoid arthritis, osteoarthritis, rheumatoid spondylitis, gouty arthritis, cancer, HIV, chronic pulmonary inflammatory disease, silicosis, pulmonary sarcosis, bone resorption diseases, reperfusion injury, autoimmune damage, graft v. host rejection, allograft rejections, fever and myalgia due to infection, fibromyalgia, AIDS related complex (ARC), keloid formation, scar tissue formation, Crohn's disease, ulcerative colitis and pyresis, irritable bowel syndrome, osteoporosis, cerebral malaria and bacterial meningitis.

15. Use according to claim 8, or use of a compound of formula (VII) as defined in claim 6, in the manufacture of a medicament for the prevention, treatment, or amelioration of ischaemic pain.

16. Use according to claim 8 or 15 in the manufacture of a medicament for the prevention, treatment, or amelioration of pain associated with coronary artery disease, peripheral artery disease, left ventricular hypertrophy, essential hypertension, acute hypertensive emergency, cardiomyopathy, heart insufficiency, exercise tolerance, chronic heart failure, arrhythmia, cardiac dysrhythmia, syncopy, arteriosclerosis, mild chronic heart failure, angina pectoris, Prinzmetal's (variant) angina, stable angina, exercise induced angina, cardiac bypass reocclusion, intermittent claudication (arteriosclerosis oblitterens), arteritis, diastolic dysfunction, systolic dysfunction, atherosclerosis, post ischaemia/reperfusion injury, diabetes (Types I or II), thromboembolisms, haemorrhagic accidents, or neuropathic or inflammatory pain arising from hypoxia-induced nerve cell damage.

17. Use of a compound as defined in any of claims 1 to 5, or a compound of formula (VII) as defined in claim 6 or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for the prevention, treatment, or amelioration of macro or micro vascular complications of type 1 and 2 diabetes, retinopathy, nephropathy, autonomic neuropathy, or blood vessel damage caused by ischaemia or atherosclerosis.

18. Use of a compound as defined in any of claims 1 to 5, or a pharmaceutically acceptable salt of a compound of formula (VII) as defined in claim 6, for the manufacture of a medicament for the prevention, treatment, or amelioration of inflammation.

19. Use according to claim 18 for the prevention, treatment, or amelioration of inflammation caused by or associated with: cancer (such as leukemias, lymphomas, carcinomas, colon cancer, breast cancer, lung cancer, pancreatic cancer, hepatocellular carcinoma, kidney cancer, melanoma, hepatic, lung, breast, and prostate metastases, etc.); auto-immune disease (such as organ transplant rejection, lupus erythematosus, graft v. host rejection, allograft rejections, multiple sclerosis, rheumatoid arthritis, type I diabetes mellitus including the destruction of pancreatic islets leading to diabetes and the inflammatory consequences of diabetes);

autoimmune damage (including multiple sclerosis, Guillam Barre Syndrome, myasthenia gravis); obesity; cardiovascular conditions associated with poor tissue perfusion and inflammation (such as atheromas, atherosclerosis, stroke, ischaemia-reperfusion injury, claudication, congestive heart failure, vasculitis, haemorrhagic shock, vasospasm following subarachnoid haemorrhage, vasospasm following cerebrovascular accident, pleuritis, pericarditis, the cardiovascular complications of diabetes); ischaemia-reperfusion injury, ischaemia and associated inflammation, restenosis following angioplasty and inflammatory aneurysms; epilepsy, neurodegeneration (including Alzheimer's Disease), muscle fatigue or muscle cramp (particularly athletes' cramp), arthritis (such as rheumatoid arthritis, osteoarthritis, rheumatoid spondylitis, gouty arthritis), fibrosis (for example of the lung, skin and liver), sepsis, septic shock, encephalitis, infectious arthritis, Jarisch-Herxheimer reaction, shingles, toxic shock, cerebral malaria, Lyme's disease, endotoxic shock, gram negative shock, haemorrhagic shock, hepatitis (arising both from tissue damage or viral infection), deep vein thrombosis, gout; conditions associated with breathing difficulties (e.g. chronic obstructive pulmonary disease, impeded and obstructed airways, bronchoconstriction, pulmonary vasoconstriction, impeded respiration, chronic pulmonary inflammatory disease, silicosis, pulmonary sarcosis, cystic fibrosis, pulmonary hypertension, pulmonary vasoconstriction, emphysema, bronchial allergy and/or inflammation, asthma, hay fever, rhinitis, vernal conjunctivitis and adult respiratory distress syndrome); conditions associated with inflammation of the skin (including psoriasis, eczema, ulcers, contact dermatitis); conditions associated with inflammation of the bowel (including Crohn's disease, ulcerative colitis and pyresis, irritable bowel syndrome, inflammatory bowel disease); HIV (particularly HIV infection), bacterial meningitis, TNF-enhanced HIV replication, TNF inhibition of AZT and DDI activity, osteoporosis and other bone resorption diseases, osteoarthritis, rheumatoid arthritis, infertility from endometriosis, fever and myalgia due to infection, cachexia secondary to cancer, cachexia secondary to infection or malignancy, cachexia secondary to acquired immune deficiency syndrome (AIDS), AIDS related complex (ARC), keloid formation, scar tissue formation, adverse effects from amphotericin B treatment, adverse effects from interleukin-2 treatment, adverse effects from OKT3 treatment, or adverse effects from GM-CSF treatment, and other

conditions mediated by excessive anti-inflammatory cell (including neutrophil, eosinophil, macrophage and T- cell) activity.

20. Use of a compound as defined in any of claims 1 to 5, or a compound of formula (VII) as defined in claim 6 or a pharmaceutically acceptable salt thereof, in the manufacture of a disease-modifying antirheumatic drug (DMARD) for slowing the progression of arthropathy.

21. Use according to claim 20 in the manufacture of a DMARD for slowing the progression of rheumatoid arthritis.

22. Use according to any preceding claim at a dosage which, after administration to a subject, gives rise to a peak plasma concentration of the compound that is less than the EC50 value of the compound at adenosine receptors at pH 7.4.

23. Use according to any preceding claim at a dosage that is one thousandth to one fifth of the minimum dose of the compound that gives rise to bradycardia, hypotension or tachycardia side effects in animals of the same species as the subject to which the compound is to be administered.

24. Use according to claim 23, wherein the dose is one hundredth to one fifth of the minimum dose that gives rise to the side effects.

25. Use according to any preceding claim at a dosage which, after administration to a subject, gives rise to a plasma concentration of the compound that is maintained for more than one hour between one thousandth and one half of the minimum dose of the compound that gives rise to bradycardia, hypotension or tachycardia side effects in animals of the same species as the subject to which the compound is to be administered.

26. Use according to any preceding claim at a dosage of less than 0.4mg/kg.

27. Use according to any preceding claim at a dosage of at least 0.003mg/kg.

28. Use according to any preceding claim at a dosage of 0.01 to 0.1mg/kg.

29. A compound with a structure corresponding to any of compound numbers 2, 3, 7-18, 22-25, 31-33, 35, 37, 40, 44, 45, 47, 48, or 51-60 as defined in Examples 1-6, or a pharmaceutically acceptable salt thereof.

30. A method of preventing, treating, or ameliorating a pathological condition that can be prevented or improved by agonism of adenosine A2A receptors, which comprises administering a compound as defined in any of claims 1 to 5, or a pharmaceutically acceptable salt of a compound of formula (VII) as defined in claim 6, to a subject in need of such prevention, treatment, or amelioration.

31. A method of preventing, treating, or ameliorating a pathological condition that can be prevented or improved by agonism of adenosine A2A receptors, excluding pain, cancer, inflammation, auto-immune disease, ischemia-reperfusion injury, epilepsy, sepsis, septic shock, neurodegeneration (including Alzheimer's Disease), muscle fatigue and muscle cramp, which comprises administering a compound of formula (VII) as defined in claim 6 to a subject in need of such prevention, treatment, or amelioration.

32. A method of preventing, treating, or ameliorating pain which comprises administering a compound as defined in any of claims 1 to 5, or a pharmaceutically acceptable salt of a compound of formula (VII) as defined in claim 6, to a subject in need of such prevention, treatment, or amelioration.

33. A method of preventing, treating, or ameliorating ischaemic pain which comprises administering a compound as defined in any of claims 1 to 5, or a compound of formula (VII) as defined in claim 6 or a pharmaceutically acceptable salt thereof, to a subject in need of such prevention, treatment, or amelioration.

34. A method according to claim 33 for the prevention, treatment, or amelioration of ischaemic pain associated with coronary artery disease, peripheral artery disease,

left ventricular hypertrophy, essential hypertension, acute hypertensive emergency, cardiomyopathy, heart insufficiency, exercise tolerance, chronic heart failure, arrhythmia, cardiac dysrhythmia, syncopy, arteriosclerosis, mild chronic heart failure, angina pectoris, Prinzmetal's (variant) angina, stable angina, exercise induced angina, cardiac bypass reocclusion, intermittent claudication (arteriosclerosis oblitterens), arteritis, diastolic dysfunction, systolic dysfunction, atherosclerosis, post ischaemia/reperfusion injury, diabetes (Types I or II), thromboembolisms, haemorrhagic accidents, or neuropathic or inflammatory pain arising from hypoxia-induced nerve cell damage.

35. A method of prevention, treatment, or amelioration of inflammation, which comprises administering a compound as defined in any of claims 1 to 5, or a pharmaceutically acceptable salt of a compound of formula (VII) as defined in claim 6, to a subject in need of such prevention, treatment, or amelioration.

36. A method according to claim 35 for the prevention, treatment, or amelioration of inflammation caused by or associated with: cancer (such as leukemias, lymphomas, carcinomas, colon cancer, breast cancer, lung cancer, pancreatic cancer, hepatocellular carcinoma, kidney cancer, melanoma, hepatic, lung, breast, and prostate metastases, etc.); auto-immune disease (such as organ transplant rejection, lupus erythematosus, graft v. host rejection, allograft rejections, multiple sclerosis, rheumatoid arthritis, type I diabetes mellitus including the destruction of pancreatic islets leading to diabetes and the inflammatory consequences of diabetes); autoimmune damage (including multiple sclerosis, Guillam Barre Syndrome, myasthenia gravis); obesity; cardiovascular conditions associated with poor tissue perfusion and inflammation (such as atheromas, atherosclerosis, stroke, ischaemia-reperfusion injury, claudication, congestive heart failure, vasculitis, haemorrhagic shock, vasospasm following subarachnoid haemorrhage, vasospasm following cerebrovascular accident, pleuritis, pericarditis, the cardiovascular complications of diabetes); ischaemia-reperfusion injury, ischaemia and associated inflammation, restenosis following angioplasty and inflammatory aneurysms; epilepsy, neurodegeneration (including Alzheimer's Disease), muscle fatigue or muscle cramp (particularly athletes' cramp), arthritis (such as rheumatoid arthritis, osteoarthritis,

rheumatoid spondylitis, gouty arthritis), fibrosis (for example of the lung, skin and liver), sepsis, septic shock, encephalitis, infectious arthritis, Jarisch-Herxheimer reaction, shingles, toxic shock, cerebral malaria, Lyme's disease, endotoxic shock, gram negative shock, haemorrhagic shock, hepatitis (arising both from tissue damage or viral infection), deep vein thrombosis, gout; conditions associated with breathing difficulties (e.g. chronic obstructive pulmonary disease, impeded and obstructed airways, bronchoconstriction, pulmonary vasoconstriction, impeded respiration, chronic pulmonary inflammatory disease, silicosis, pulmonary sarcosis, cystic fibrosis, pulmonary hypertension, pulmonary vasoconstriction, emphysema, bronchial allergy and/or inflammation, asthma, hay fever, rhinitis, vernal conjunctivitis and adult respiratory distress syndrome); conditions associated with inflammation of the skin (including psoriasis, eczema, ulcers, contact dermatitis); conditions associated with inflammation of the bowel (including Crohn's disease, ulcerative colitis and pyresis, irritable bowel syndrome, inflammatory bowel disease); HIV (particularly HIV infection), bacterial meningitis, TNF-enhanced HIV replication, TNF inhibition of AZT and DDI activity, osteoporosis and other bone resorption diseases, osteoarthritis, rheumatoid arthritis, infertility from endometriosis, fever and myalgia due to infection, cachexia secondary to cancer, cachexia secondary to infection or malignancy, cachexia secondary to acquired immune deficiency syndrome (AIDS), AIDS related complex (ARC), keloid formation, scar tissue formation, adverse effects from amphotericin B treatment, adverse effects from interleukin-2 treatment, adverse effects from OKT3 treatment, or adverse effects from GM-CSF treatment, and other conditions mediated by excessive anti-inflammatory cell (including neutrophil, eosinophil, macrophage and T- cell) activity.

37. A method of preventing, treating, or ameliorating macro or micro vascular complications of type 1 and 2 diabetes, retinopathy, nephropathy, autonomic neuropathy, or blood vessel damage caused by ischaemia or atherosclerosis which comprises administering a compound as defined in any of claims 1 to 5, or a compound of formula (VII) as defined in claim 6 or a pharmaceutically acceptable salt thereof, to a subject in need of such prevention, treatment, or amelioration.

38. A method of slowing the progression of arthropathy, which comprises administering a compound as defined in any of claims 1 to 5, or a compound of formula (VII) as defined in claim 6 or a pharmaceutically acceptable salt thereof, as a disease-modifying antirheumatic drug (DMARD) to a subject in need thereof.

39. A method according to claim 38, for slowing the progression of rheumatoid arthritis.

40. A method according to any of claims 30 to 39, wherein the compound is administered at a dose that gives rise to a peak plasma concentration of the compound that is less than the EC50 value of the compound at adenosine receptors at pH 7.4.

41. A method according to any of claims 30 to 40, wherein the compound is administered to the subject in an amount that results in a peak plasma concentration of the compound in the subject that is one ten thousandth to one half of the lowest EC50 value of the compound at adenosine receptors.

42. A method according to any of claims 30 to 41, wherein the compound is administered to the subject in an amount that results in a plasma concentration of the compound in the subject being maintained for more than one hour at one ten thousandth to one half of the lowest EC50 value of the compound at adenosine receptors.

43. A method according to any of claims 30 to 42, wherein the compound is administered to the subject in an amount that results in a peak plasma concentration of the compound in the subject that is one ten thousandth to one half of the lowest Kd value of the compound at adenosine receptors.

44. A method according to any of claims 30 to 43, wherein the compound is administered to the subject in an amount that results in a plasma concentration of the compound in the subject being maintained for more than one hour at one ten thousandth to one half of the lowest Kd value of the compound at adenosine receptors.

45. A method according to any of claims 30 to 44, wherein the compound is administered to the subject in an amount that is one ten thousandth to one half of the minimum amount of the compound that gives rise to bradycardia, hypotension or tachycardia side effects in animals of the same species as the subject to which the compound is administered.

46. A method according to any of claims 30 to 45, wherein the compound is administered at a dose that is one thousandth to one half of the minimum dose of the compound that gives rise to bradycardia, hypotension or tachycardia side effects in animals of the same species as the subject to which the dose is to be administered.

47. A method according to claim 46, wherein the dose is one hundredth to one half of the minimum dose that gives rise to the side effects

48. A method according to any of claims 30 to 47, wherein the compound is administered to the subject in an amount that results in a plasma concentration of the compound in the subject being maintained for more than one hour at one ten thousandth to one half of the minimum plasma concentration of the compound that gives rise to bradycardia, hypotension or tachycardia side effects in animals of the same species as the subject to which the compound is administered.

49. A method according to any of claims 30 to 48, wherein the compound is administered at a dose that results in a plasma concentration of the compound that is maintained for more than one hour between one hundredth and one half of the minimum dose of the compound that gives rise to bradycardia, hypotension or tachycardia side effects in animals of the same species as the subject to which the compound is to be administered.

50. A method according to any of claims 30 to 49, wherein the compound is administered at a dose of less than 0.4mg/kg.

51. A method according to any of claims 30 to 50, wherein the compound is administered at a dosage of 0.001 to 0.4mg/kg.

52. A method according to any of claims 30 to 51, wherein the compound is administered at a dose of at least 0.003mg/kg.

53. A method according to any of claims 30 to 52, wherein the compound is administered at a dose of 0.01 to 0.1mg/kg.

54. A method according to any of claims 30 to 53, wherein the compound is administered orally, parenterally, sublingually, transdermally, intrathecally, transmucosally, intravenously, intramuscularly, subcutaneously, topically, or by inhaling.

55. A method according to any of claims 30 to 54, wherein the compound is administered at a frequency of 2 or 3 times per day.

56. A method according to any of claims 30 to 55, wherein the subject is a human subject.

57. Use according to claim 20 or 21, or a method according to claim 38 or 39, wherein the compound is spongosine or a pharmaceutically acceptable salt thereof.

58. A pharmaceutical composition in unit dose form comprising up to 500mg of a compound as defined in any of claims 1 to 5, and a physiologically acceptable carrier, excipient, or diluent.

59. A pharmaceutical composition in unit dose form comprising up to 500mg of a compound as defined in any of claims 1 to 5, or a compound of formula (VII) as defined in claim 6 or a pharmaceutically acceptable salt thereof, together with an NSAID or a DMARD, and a physiologically acceptable carrier, excipient, or diluent.

60. A method of producing compound number 2 or 32 as defined in Example 1, which comprises reacting pentabenzoyl-2-nitro-adenosine with ROH, and deprotecting the reaction product to produce compound number 2 or 32, wherein R = CH_2CHF_2 or CH_2cyclopentyl.

61. A method of producing compound number 3 or 35 as defined in Example 1, which comprises reacting triacetoxy-6-chloro-2-nitro-adenosine with ROH, and deprotecting the reaction product to produce compound number 3 or 35, wherein R = CH_2Cyclopropyl or 2,2,3,3-tetrafluorocyclobutane.

62. A method of producing any of compound numbers 7-18 as defined in Example 1, which comprises reacting pentabenzoyl-2-nitro-adenosine with ArOH, and deprotecting the reaction product to produce any of compound numbers 7-18, wherein Ar = 4-cyanophenyl, 3-phenyl-phenyl, 2,5-difluorophenyl, 2,4-difluorophenyl, 3,4-difluorophenyl, 2,3,5-trifluorophenyl, 3-methyl,4-fluorophenyl, 2-methylphenyl, 3-bromophenyl, 4-methylphenyl, 5-indanyl, or 3-isopropylphenyl.

63. A method of producing any of compound numbers 22-25 or 31 as defined in Example 1, which comprises reacting 2-chloroadenosine with RR'NH to produce any of compound numbers 22-25 or 31, wherein RR'N = NH-(R)-sec-butyl, NH-(S)-sec-butyl, NH-n-Hexyl, NH-exo-norbornane, or N(Me)isoamyl.

64. A method of producing compound number 33 as defined in Example 1, which comprises reacting 2-chloro-adenosine with NaSEt to produce 2-ethylthio-adenosine, then producing compound number 33 from the 2-ethylthio-adenosine.

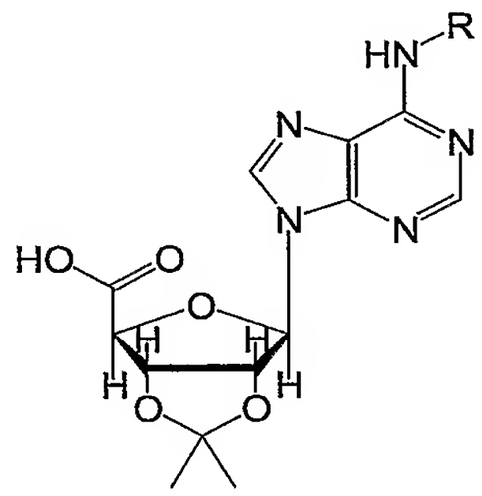
65. A method of producing compound number 37 as defined in Example 1, which comprises reacting 2-iodo-adenosine with $ArB(OH)_2$, wherein Ar = 3,5-dimethylphenyl.

66. A method of producing compound 40 as defined in Example 1, which comprises reacting 3'-deoxy-tetrabenzoyl-2-nitro-adenosine with n-hexanol, and deprotecting the reaction product to produce compound number 40.

67. A method of producing compound number 44, 45, or 47 as defined in Example 2, which comprises reacting 6-chloro-adenosine with RR'NH, wherein RR'N = $N(Me)CH_2$(3-bromophenyl), $N(Me)CH_2$(3-trifluoromethylphenyl), or $N(Me)CH_2CH_2OMe$.

68. A method of producing compound number 48 as defined in Example 2, which comprises reacting tri-acetoxy-6-chloro-adenosine with cyclopentylmethyl alcohol and deprotecting the reaction product to produce compound number 48.

69. A method of producing compound number 51 or 52 as defined in Example 3, which comprises reacting 2',3'-O-isopropylidene-6-alkylamino-adenosine-5'-carboxylic acid of the following formula:



wherein R = Me or isoamyl;
with isopropylamine, and deprotecting the acentonide group of the reaction product to produce compound number 51 or 52.

70. A method of producing compound number 53 as defined in Example 3, which comprises reacting 2',3'-O-isopropylidene-2-methoxy-adenosine-5'-carboxylic acid with aniline, and deprotecting the acetonide group of the reaction product to produce compound number 53.

71. A method of producing compound number 54 as defined in Example 3, which comprises reacting 2',3'-O-isopropylidene-2-chloro-adenosine-5'-carboxylic acid with n-hexylamine, reacting the reaction product with n-Butylamine, and deprotecting the acetonide group of the product of the reaction with n-Butylamine to produce compound number 54.

72. A method of producing compound number 55 as defined in Example 4, which comprises reacting 2',3'-O-isopropylidene-5'-amino-adenosine with butyric acid, and deprotecting the acetonide group of the reaction product to produce compound number 55.

73. A method of producing compound number 56 as defined in Example 4, which comprises reacting 2',3'-O-isopropylidene-5'-amino-adenosine with ethyl isocyanate, and deprotecting the acetonide group of the reaction product to produce compound number 56.

74. A method of producing compound number 57 as defined in Example 5, which comprises reacting tri-acetoxy-6-chloro-2-nitro-adenosine with dimethylamine, reacting the reaction product with cyclohexylamine, and deprotecting the product of the reaction with cyclohexylamine to produce compound 57.

75. A method of producing compound number 58 as defined in Example 5, which comprises reacting tri-acetoxy-6-chloro-2-nitro-adenosine with benzylamine, and reacting the reaction product with methoxide anion and deprotecting the protected groups to produce compound 58.

76. A method of producing compound any of compounds 59-61 as defined in Example 6, which comprises reacting 2-chloro-8-methyl-adenosine with RNH_2, wherein R is Cyclohexyl, Cyclopentyl, or n-hexyl, to produce compound number 59, 60, or 61.